



TriSolar

Mains Connect Inverter



USER MANUAL



TRISOLAR

MCI 2KW48

Features:

- **Mains Connect Inverter**
- **Continuous Output Power Rating without de-rating at up to 50°C ambient temperature.**
- **DC Battery input**
- **Solar, Wind and Hydro MPPT DC input***
- **Maximum Power Point Tracking (MPPT),**
- **Combi Connect, offering True Hybrid interactivity.**
- **Direct feed connection**
- **Solar input capacity up to a 2400Watts.**
- **Remote control replica of main control panel with LCD display*.**
- **Power Stack for increased power**
 - **Need more power?**
 - Just keep stacking!**

*Requires optional accessories, please see installation section for more information.

About TriSolar Mains Connect Inverter:

Introduction

The TriSolar MCI can operate as a true Hybrid power system where power produced from your solar panels, wind generator or hydro system can be sent back into the grid for a credit, however, authorisation from your electricity provider is required. The system can also operate as a standalone power system, allowing you to power your home during a grid failure or for an independent “Off-Grid” setup. Alternatively, for “Off-Grid systems, a backup generator can be automatically started to help support the homes power needs.

The TriSolar MCI is a highly reliable Mains Connect Inverter and its most critical feature is to maximise the harvest energy from the PV array by using the advanced technology of Maximum Power Point Tracking (MPPT). The TriSolar MCI can also be directly connected to a battery allowing for even more flexibility. The system is available in models 48VDC nominal battery voltage inputs each have built-in programmable protection to ensure the correct battery connection and disconnection voltages to avoid exhausting the battery.

A wide range of MPPT input array voltages and battery voltage inputs are available depending on your application. The DC input of MCI 2KW48 may be wired in the range of 66-128VDC or nominal battery voltage of 48VDC.

TriSolar MCI may not only be used in solar systems but also in wind or hybrid systems. With respect to these systems it is normally required to use an optional turbine controller. The controller with optional rectifier and braking unit for wind system is required to control and stop the control from overload condition caused by excessive wind speeds.

TriSolar MCI is very flexible and can be configured in many different ways. It has been designed to operate as a standalone basic grid feed, through to a truly interactive hybrid power management system. The power being generated from the solar Array, wind or hydro is fed into the TriSolar MCI where it is then transferred into an AC supply. The hybrid design allows you to operate your home during a black out and take advantage of the power being generated from the solar array unlike many conventional Mains Connect Systems. This offers home owners and businesses even more savings on their electricity bills as well as the comfort of having power during a black-out.

Please carefully read through this manual and all the installations instruction and wiring before beginning installation of your TriSolar MCI. The protection and installation equipment must comply with the local codes. The rated fuses, breakers and external lightning protection should be installed along with your TriSolar MCI.

Specifications

MODEL	48 Volt System	MCI 2KW48
Ventilation		Fan Forced cooling
Temperature	– Operation	-10°C ~ +45°C
	– Storage	-25°C ~ +80°C
Protection		
	a. Output short circuit	✓
	b. Over load	✓
	c. Battery voltage too high	✓
	d. Battery voltage too low	✓
	e. DC input voltage too high	✓
	f. DC input voltage too Low	✓
	Transformer	(105°C)
	Electronic & Powerstage	(70°C)
Humidity		0~95% (non condensing)
Combi Connect		✓
Direct Feed		✓
Anti-Islanding		(less than 10 msec)
Direct Battery Connection		✓
3-Phase Capacity		✓
Parallel Operation		✓
Remote Control Port		✓
Extension Port for PC Connection		✓
AC OUTPUT		
Output Voltage		210-255V
Cont. Power Output @ 50°C (W)		2000Watt
Under 50°C (cos θ =1.0)		(No derate 50°C)
Power Output Over 70°C		(Shutdown)
Maximum Power (W)		2200Watt
Maximum Efficiency (%)		94
Please note specifications are subject to Manufactures changes.		

DC INPUT	
Maximum DC Input Voltage (VDC)	130V
Maximum Input Current(A)	45A
Input Voltage operating Range (VDC) MPPT Mode	66-128V
Input Voltage operating Range (VDC) Battery Mode	40-64V
Battery Voltage Default (VDC)	48V
<p>(1) X should be 2, output voltage = 205-270 VAC Eg. MCI 2KW48= 230VAC Model</p> <p><i>Specifications subject to change</i></p>	
AC INPUT	
Detection Time AC Input Fault	<10 msec.
Normal AC Input Range	210VAC – 255VAC 230v Model
Trip Level AC Low Input	209VAC 230v Model
Trip Level AC High Input	255VAC 230v Model
Min.~ Max. Frequency Range	50 ± 1 Hz / 60 ± 1 Hz
MECHANICAL	
Cabinet / Protecting Class	Aluminum / IP20
Dimension (HXWXD)	368 x 256 x 424 mm
Weight (kgs)	26 kgs

1.25 3-Phase Operation

The TriSolar MCI can be configured for use in a 2 or 3-phase applications see page 32.

Note:

- Make sure you have enough battery capacity to support all of the TriSolar MCI Units.
- Install the TriSolar MCI units next to each other making sure there is adequate clearance for ventilation of at least 20 cm. For better ventilation, please install the fan cover (optional).
- The battery cables for each TriSolar MCI must be of equal in length

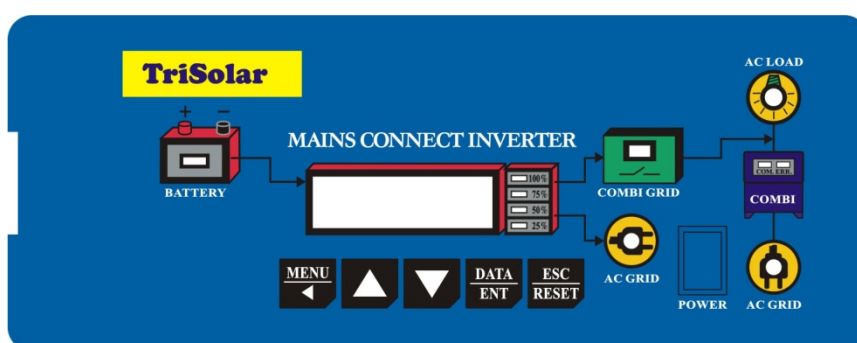
1.26 Anti-Islanding

The TriSolar MCI inverter will automatically disconnect from the utility grid when the utility grid is out of voltage / frequency range, during a black-out (grid failure) or when the inverter shuts down due to a fault condition. This is to guarantee protection for persons operating on the utility grid, and in compliance with the AS4777 standards.

1.27 Remote Control Panel (RP-MCI)

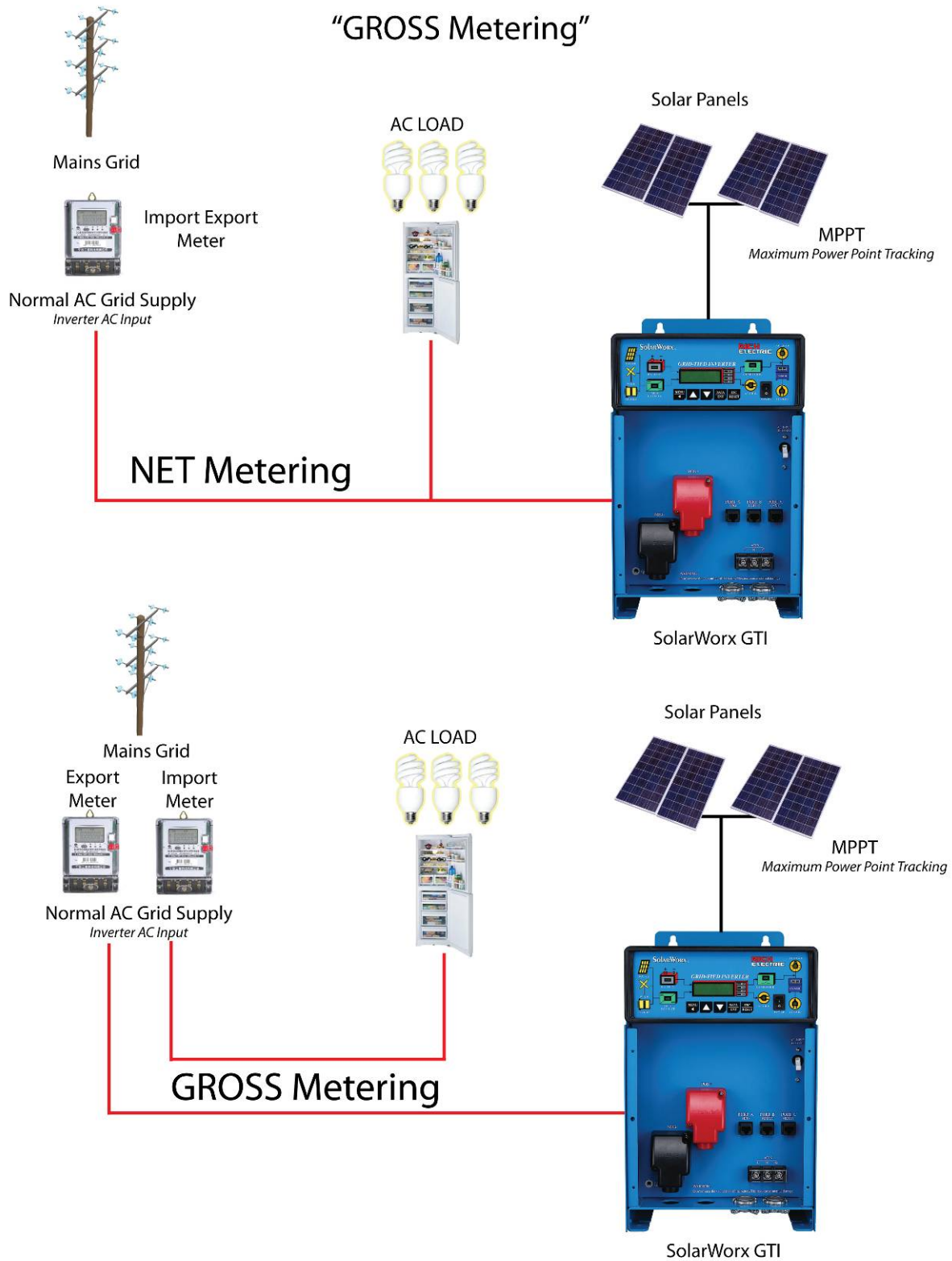
The TriSolar MCI can be operated remotely from remote port with the aid of a remote control panel. For connection of a remote control panel, see page 29.

Note: The display panel and operation flow of the remote control panel is exactly the same as the upper-front display panel.



2.12 Diagram Net vs Gross Metering

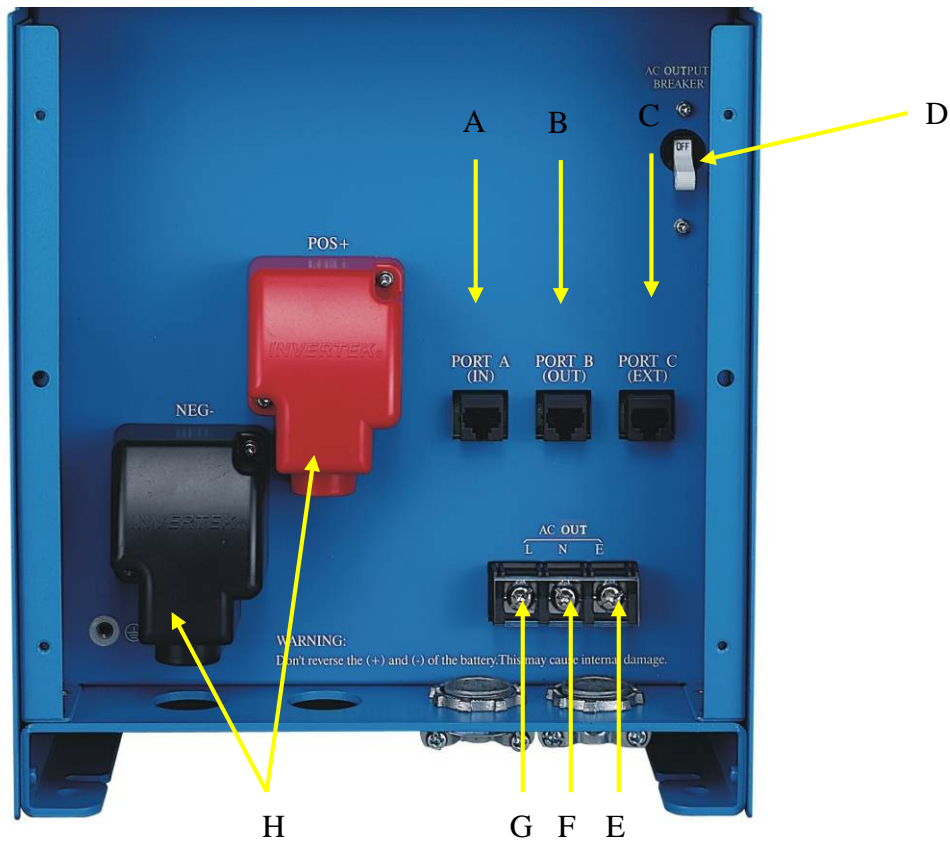
"NET Metering" VS "GROSS Metering"



Please note specifications are subject to Manufactures changes.

Chapter 3 Wiring Connections

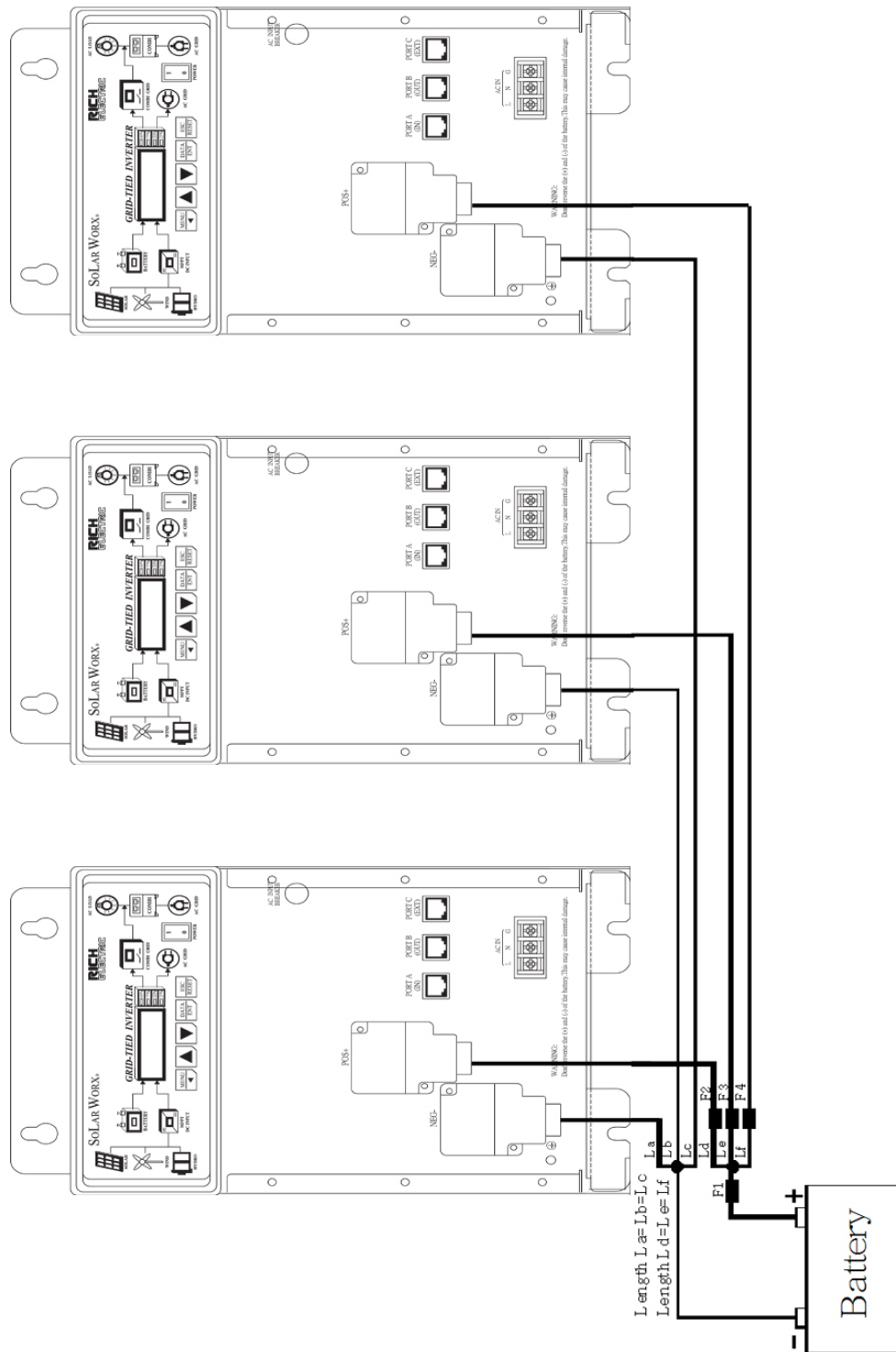
3.10 Lower-Front Panel Connection for TriSolar MCI



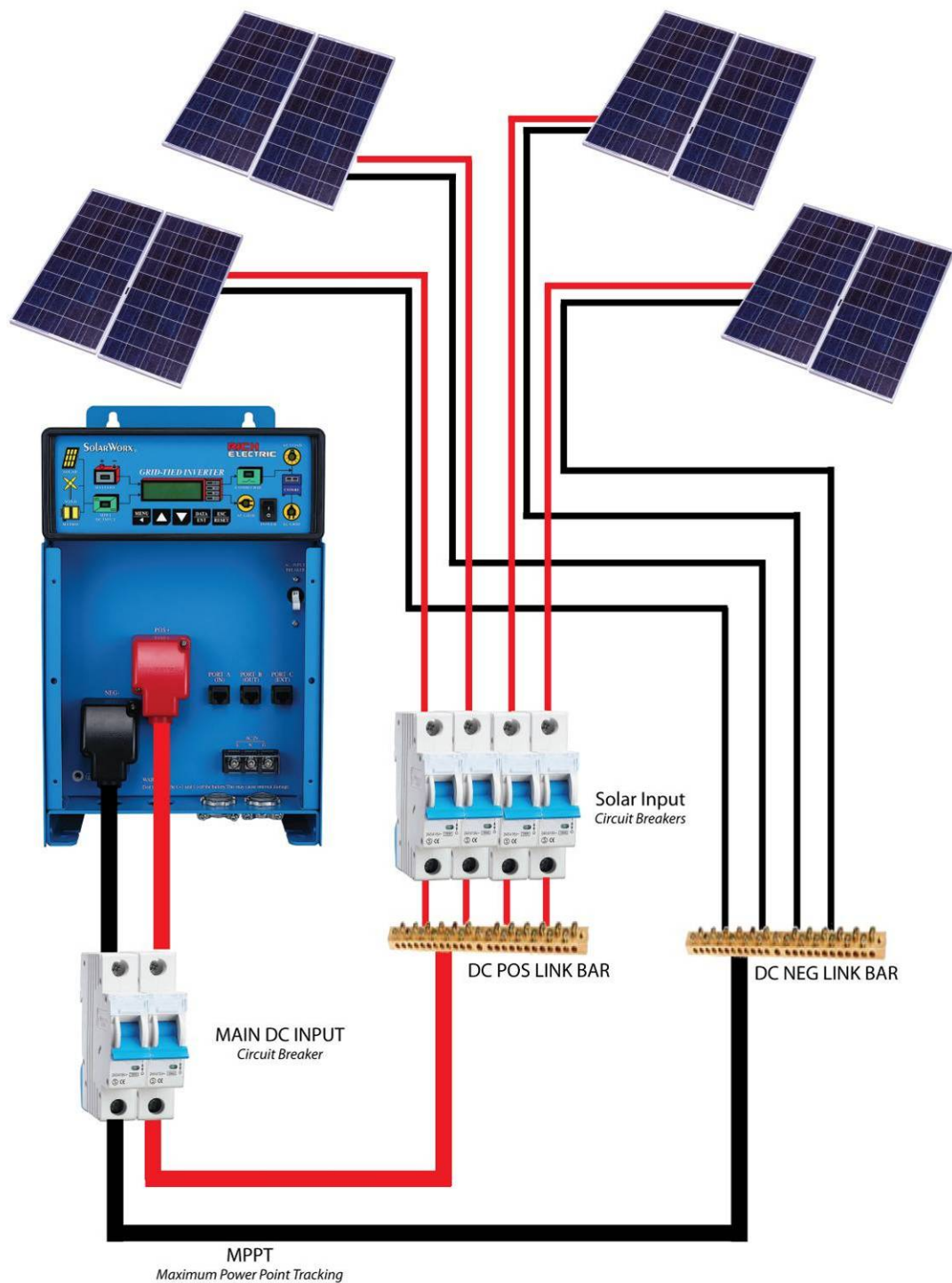
Connections / Lower- Front side

A PORT A (IN)	Connections for parallel power
B PORT B (OUT)	Connections for parallel power
C PORT C (EXT)	Connections for external Remote Control & PC
D AC Output Breaker	Mains AC output Circuit Breaker
E AC OUT E	Connecting terminal for AC output Ground (Earth)
F AC OUT N	Connecting terminal for AC output Neutral (NEG)
G AC OUT L	Connecting terminal for AC output Live (POS)
H Battery POS+/ NEG-	DC Input cables.

3.11 Battery Connection schematic



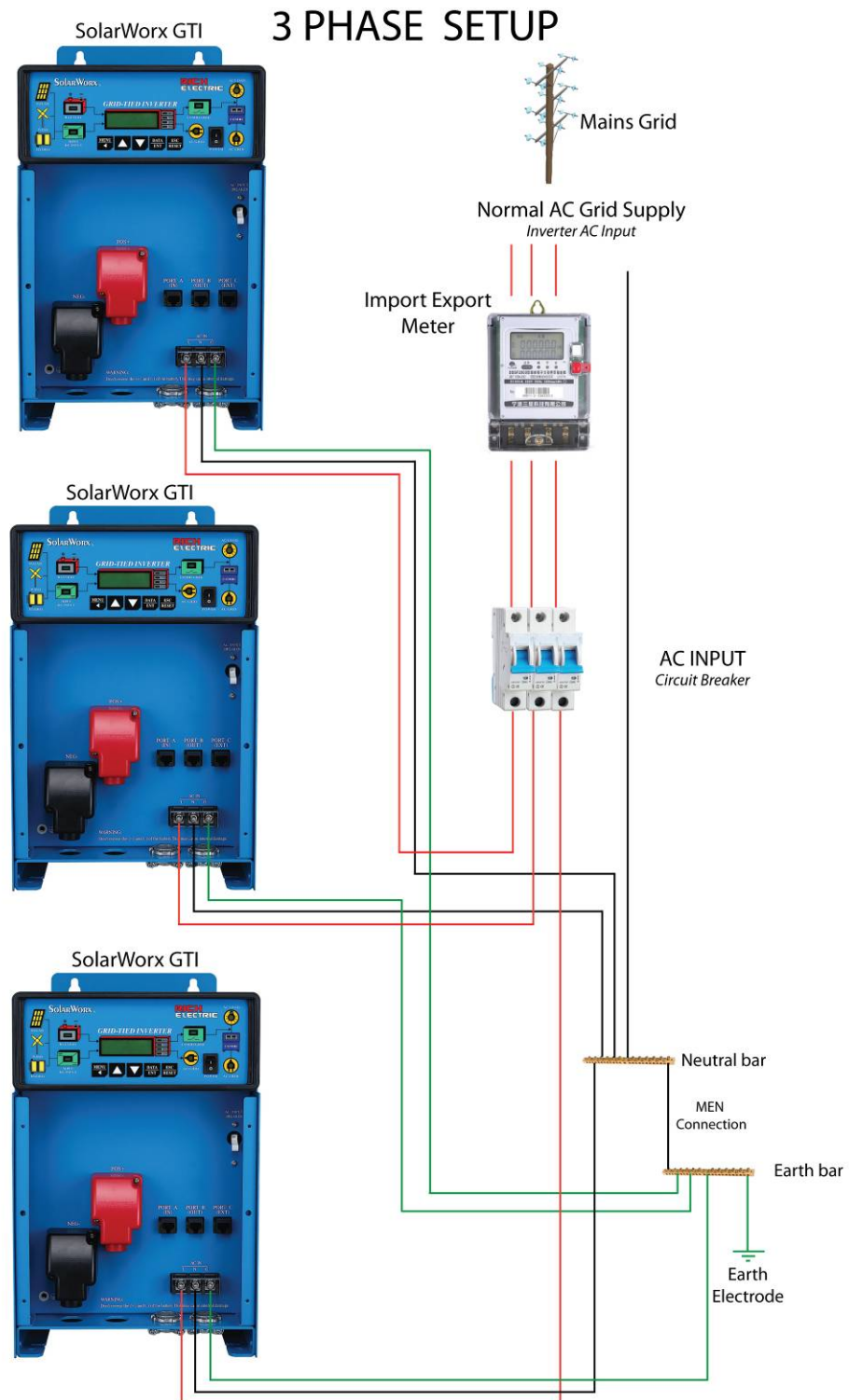
3.12 Connection Schematic “Multi Cable Solar Connection”



Please note specifications are subject to Manufactures changes.

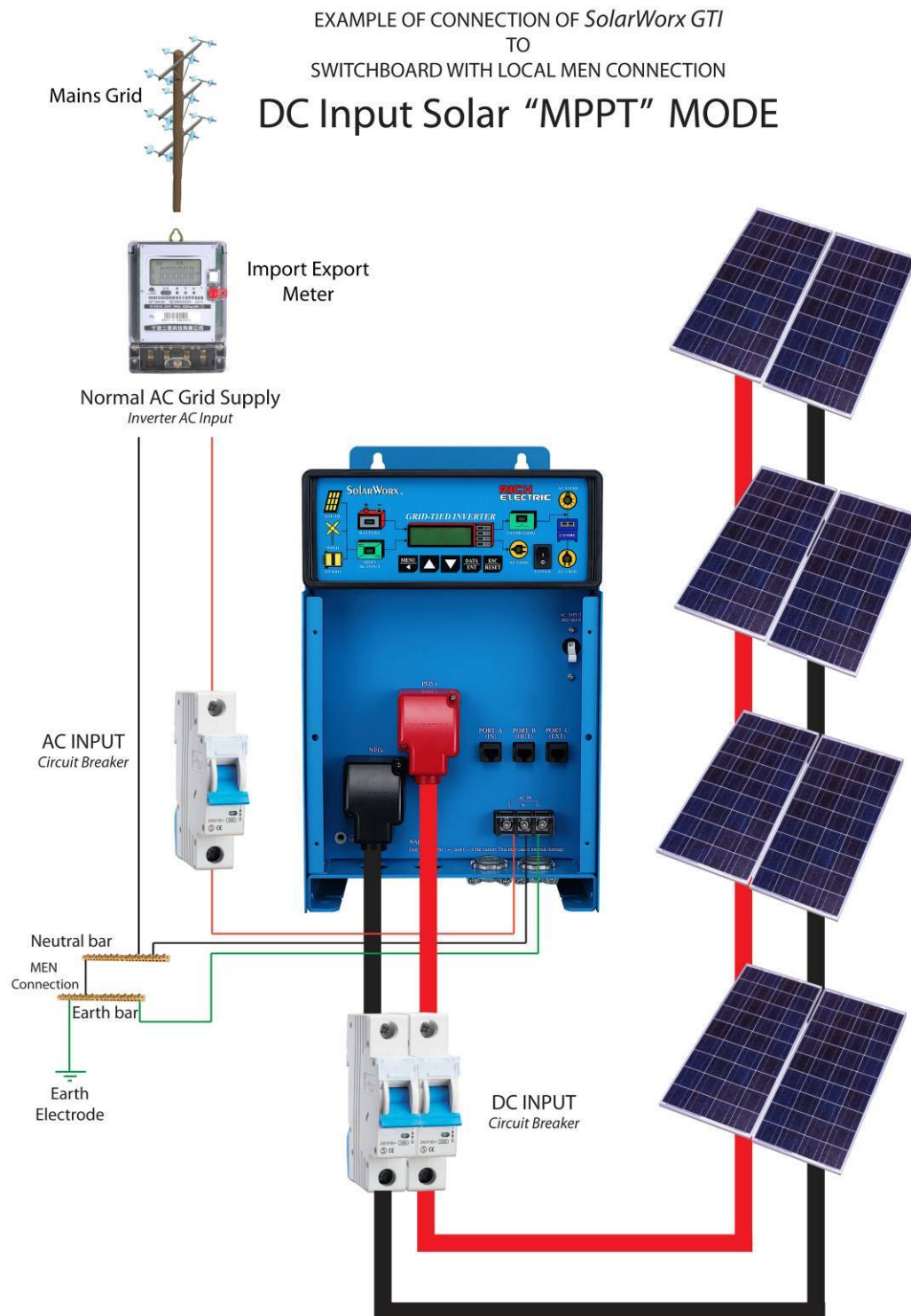
3.13 AC 3-Phase Connection Schematic

EXAMPLE OF CONNECTION OF *SolarWorx GTI*
TO
SWITCHBOARD WITH LOCAL MEN CONNECTION



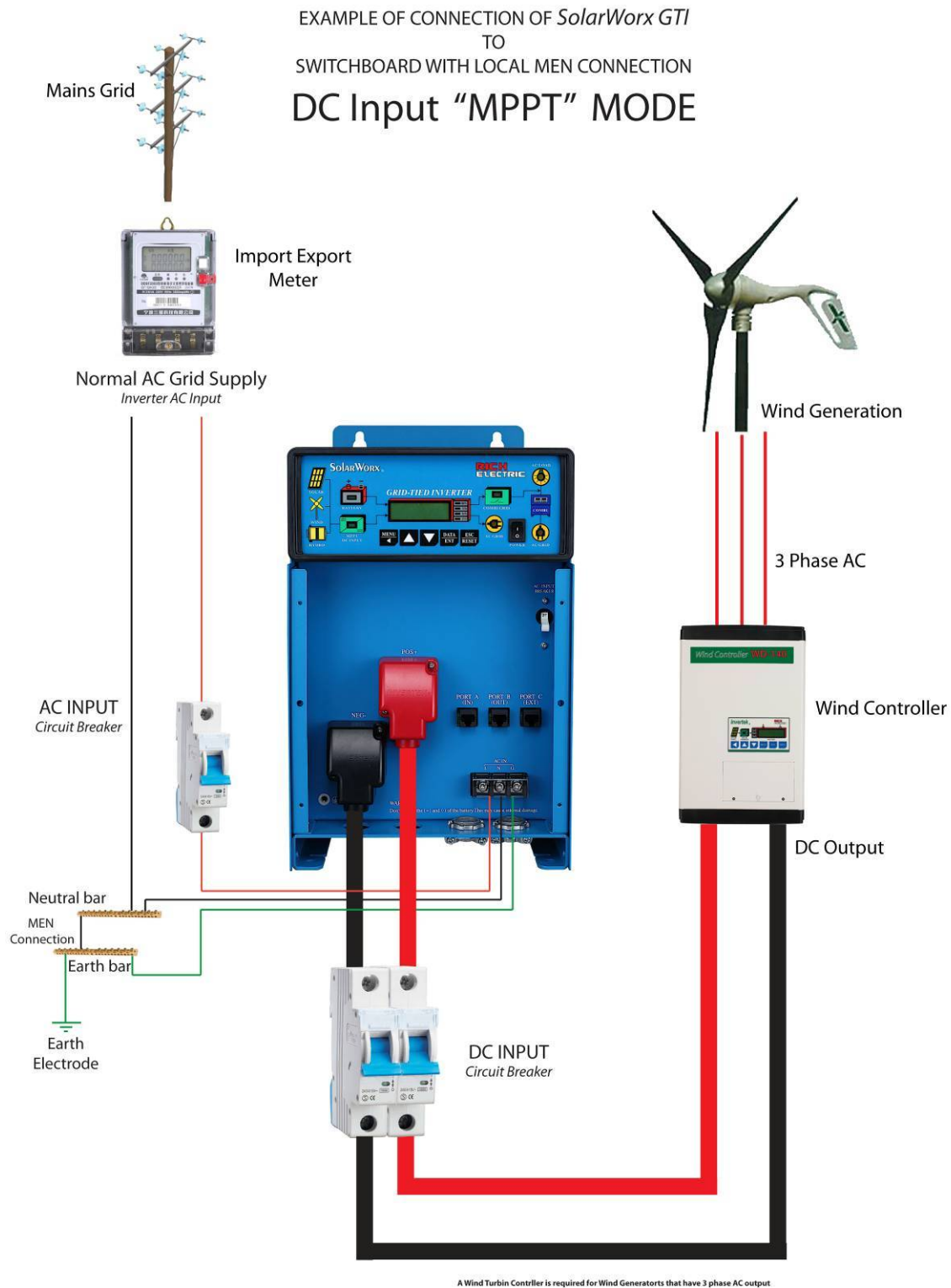
Please note specifications are subject to Manufactures changes.

3.20 Connection Schematic (Basic Solar Grid Feed)



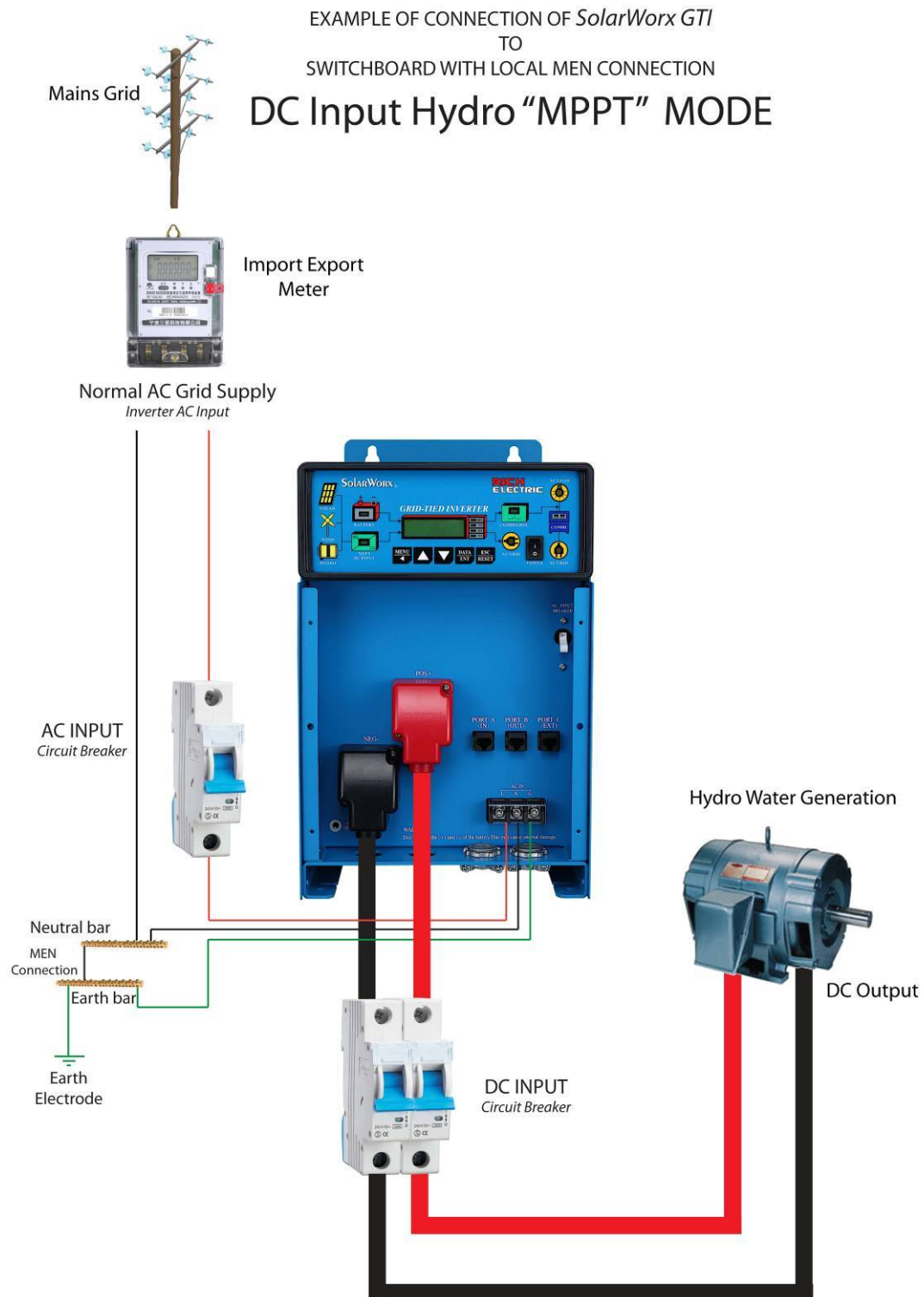
Please note specifications are subject to Manufactures changes.

3.21 Connection Schematic (Wind Grid Feed)



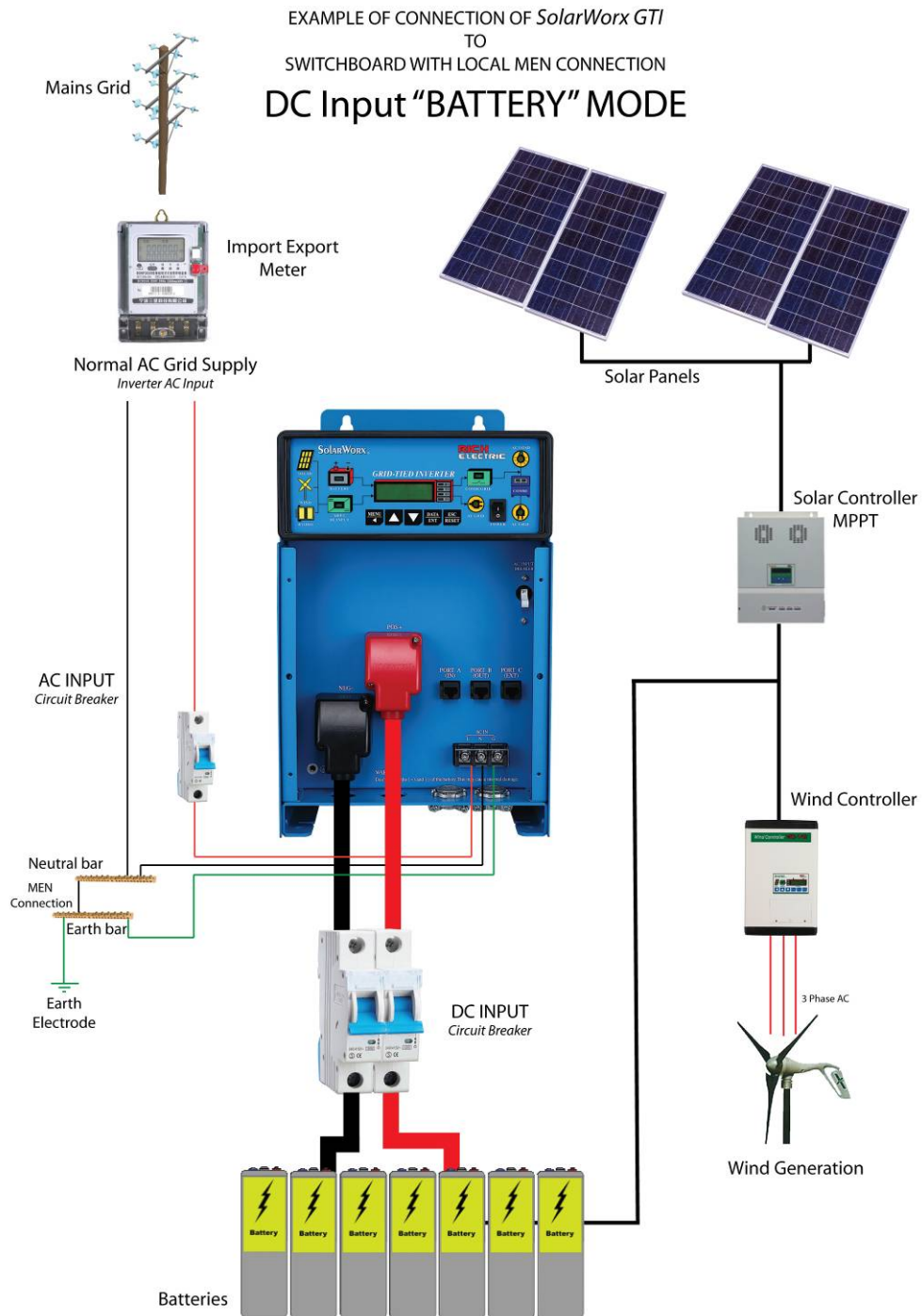
Please note specifications are subject to Manufactures changes.

3.22 Connection Schematic (Hydro Grid Feed)



Please note specifications are subject to Manufactures changes.

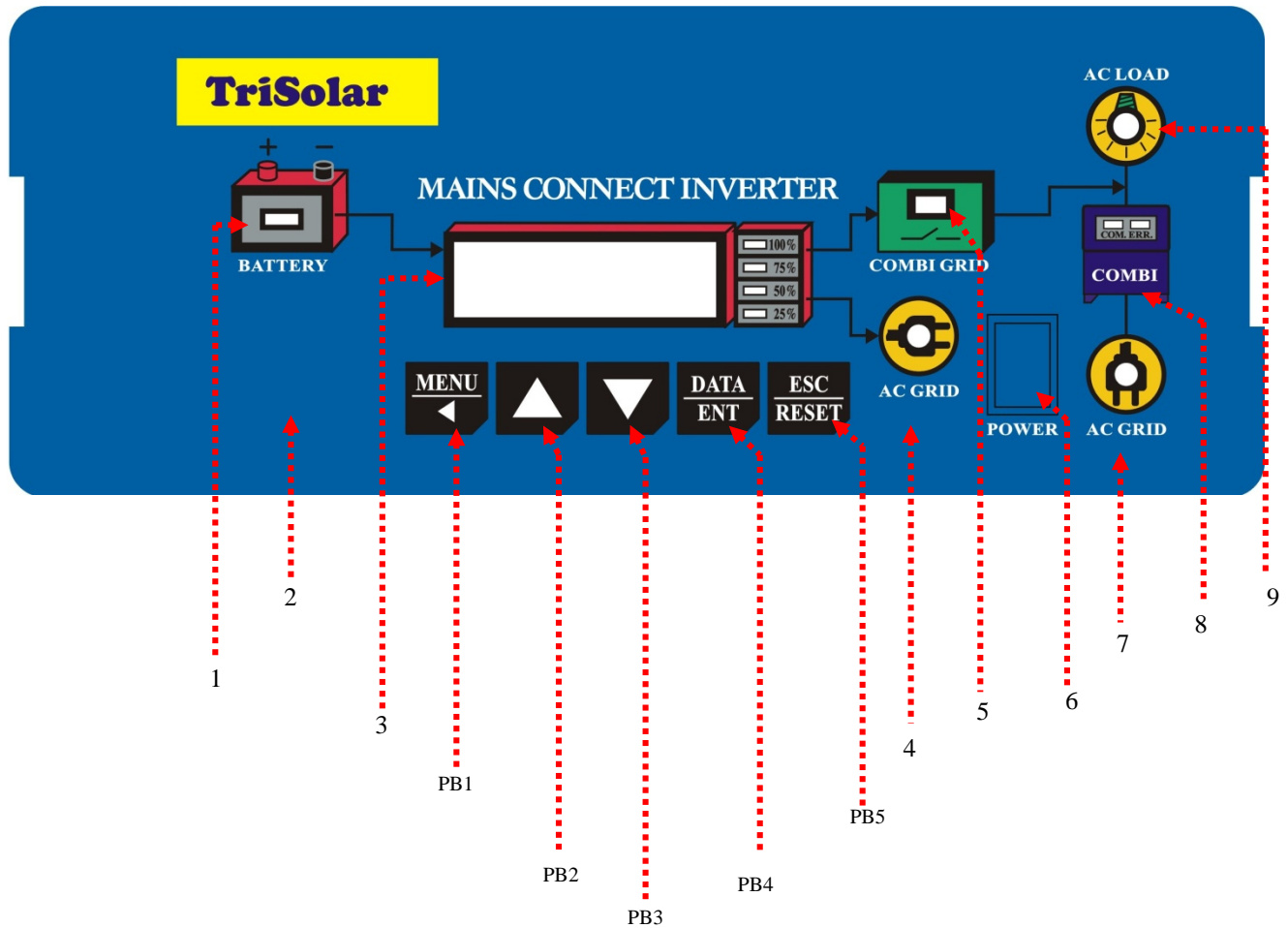
3.23 Connection Schematic (Battery Mode Grid Feed)



Please note specifications are subject to Manufactures changes.

Chapter 4 Operation

4.10 Front Panel Display



The **POWER** “rocker” switch (9) is the Master ON / OFF Switch. This switch in the “OFF” position will terminate all functions of the TriSolar MCI.

NOTE:






The AC Output is turned OFF when the inverter is Switched OFF at the Master Power Switch.

4.10 Front Panel Display

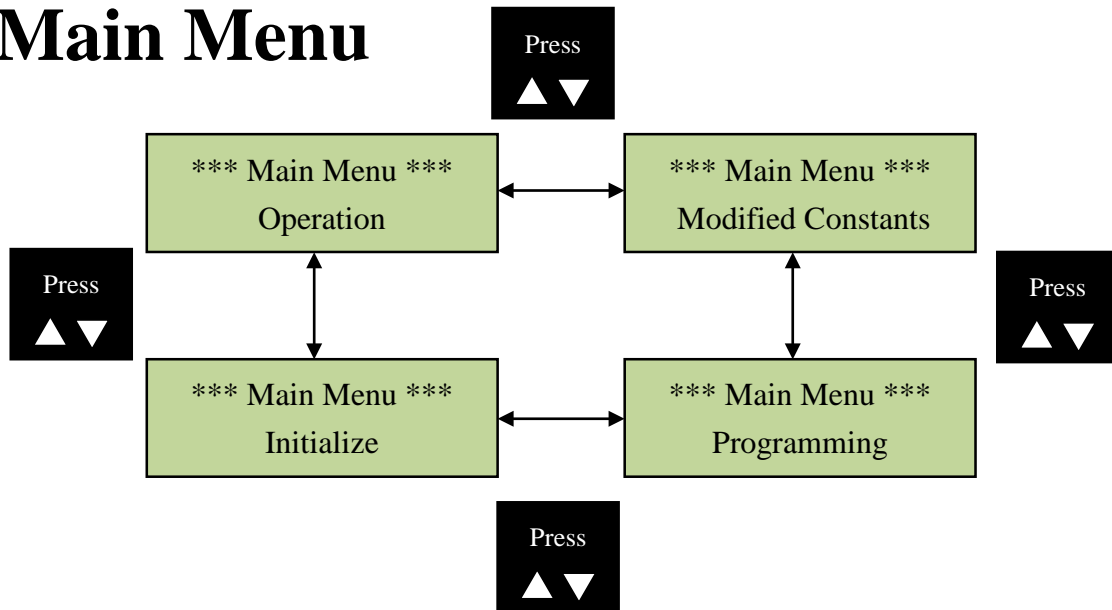
LED Indicators

LED	Name	LED ON	LED OFF
1	BATTERY	MCI is operating in Battery Mode	
2	MPPT DC INPUT	MCI is operating in MPPT Mode	
3	LCD Display	Display user information	
4	AC GRID FEED	AC Grid is stable and within the Voltage & frequency settings. Flashing: AC Grid voltage or frequency is checking.	No AC Grid (Blackout)
5	COMBI GRID	Green: Power is being sent to the Combi-Grid	Disconnected from Combi-Grid
6	POWER	MASTER Power Switch	
7	AC GRID	Yellow: Power is being used from the Mains Grid to support AC Load. (Mains AC power plus the Combi Inverter power and the MCI's power is being used).	No AC Grid (Blackout)
8	COMBI	Green : CombiNet connection is active Red: CombiNet Connect is lost. (check cable or reboot system)	Combi Not Connected or wrong communication settings
9	AC LOAD	Yellow: TriSolar MCI is supplying power to the Combi-Grid to support the Combi.	There is NO AC output to the load

Front Panel: Button Operations

	Push buttons	Name	Description
PB1	MENU Arrow <		1. Function Key to move Cursor to the left digit at Parameter Edit. 2. Function key to return to Main Menu.
PB2	UP (△)		△ Increment key to edit Parameter value.
PB3	DOWN (▽)		▽ Decrement key to edit Parameter value.
PB4	DATA ENT		Function Key to edit Data value and Data write-in key
PB5	ESC RESET		Returns to the status before the DATA/ENTER key was pressed.

Main Menu



Note: After the set time period (01-02: Key Idle Detect Time) the system will exit any menu MCI screens and return to the standby display (01-01: Power ON LCD Monitor Select).

4.30 Main Menu

There are four options in the Main Menu of the “TriSolar MCI” and they are “**Operation**”, “**Initialize**”, “**Programming**” and “**Modified Constants**”.

Function	Content
Operation	“TriSolar MCI” can monitor Operation Status, Output Watts, AC-Grid Voltage, AC-Grid period, DC-IN voltage, Output current, accumulated energy, model number, Elapsed Time and Software Version. This is U (Monitor Group) constants.
Initialize	Operation Condition Setting Group A (Initialize) Group: constants initialization setting and constants modification allowed/prohibited setting.
Programming	Constant groups to program (modify) all the constants: B (General) Group, O (Operator) Group, and PC communication Group
Modified Constants	Operating the read-out and modification of the constants group setting which are different from initial setting. Users can program and modify constants

Note: On any Menu Screen, pressing “ESC” key will return you to the previous Menu.

Main Menu: Operation

“Monitor”

U1-00: Operation Status

Main Menu>Operation>ENT>Monitor>ENT>

- Use U1-00 to monitor the current status of the MCI,
- Waiting, MCI Fault, Grid Fault, No Utility, MCI OH (Over Heat), Grid Check, Normal.

U1-01: Output Watts

Main Menu>Operation>ENT>Monitor>ENT>

- Use U1-01 to monitor the current output wattage value of AC power out in units of 0.1W.

U1-02: AC-Grid Voltage

Main Menu>Operation>ENT>Monitor>ENT>

- Use U1-02 to monitor AC IN voltage value in units of 0.1V.

U1-03: AC-Grid Frequency

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-03 to monitor AC IN Frequency value in units of 0.1Hz.

U1-04: AC OUT Current

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-04 to monitor DC-IN voltage value in units of 0.1V.

U1-05: Output Current

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-05 to monitor the output current value in units of 0.01A

U1-06: Accumulated Energy

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-06 to monitor the accumulated energy in unit of 1kWh.

U1-07: Model Number

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-07 to display the model number of the MCI.

U1-08: Elapsed Time

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-08 to monitor the elapsed time after power ON (O1-03=0) or after RUN (O1-03=1) in units of 1 hour.

U1-09: Software Version

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-09 to check the software version.